Comprehensive Remedial Investigation/Feasibility Study for Argonne National Laboratory-West Operable Unit 9-04 at the Idaho National Engineering and Environmental Laboratory

1. INTRODUCTION

1.1 Purpose and Scope of Report

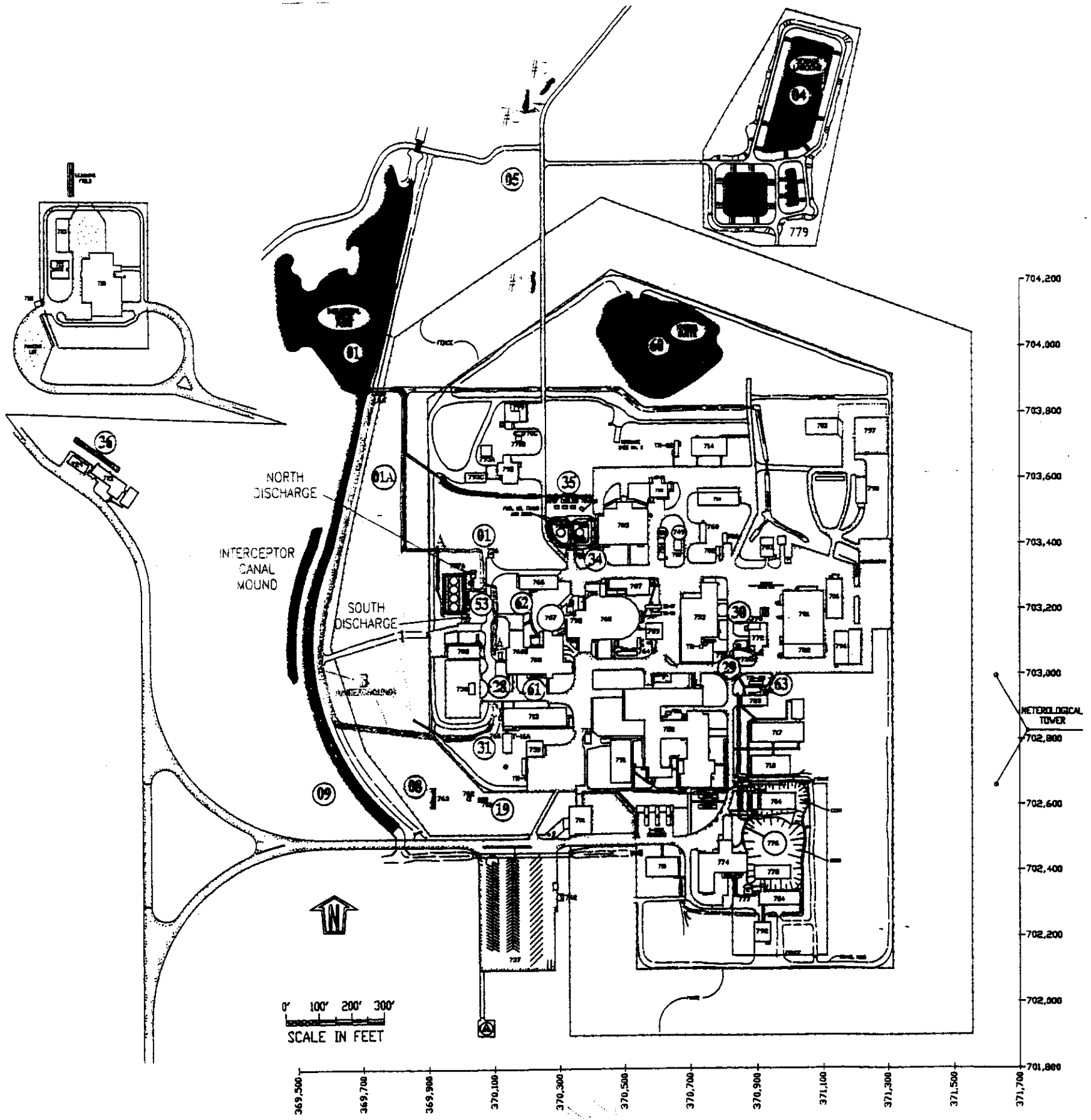
The Department of Energy Chicago Operations Office (DOE-CH) is conducting a remedial investigation/feasibility study (RI/FS) for the four operable units (OUs) located at Argonne National Laboratory-West (ANL-W) of the Idaho National Engineering and Environmental Laboratory (INEEL) in eastern Idaho. This investigation is being conducted in accordance with a Federal Facility Agreement and Consent Order (FFA/CO) between the Environmental Protection Agency (EPA) Region 10, the State of Idaho Department of Health and Welfare (IDHW), and the Department of Energy Idaho Operations Office (DOE-ID).

ANL-W is included as Waste Area Group (WAG) 9 of the 10 INEEL WAGs identified in the FFA/CO. WAG 9 is further subdivided into four Operable Units (OUs) which are classified as: Remedial Investigation (RI) Sites, Track 2 Sites, Track 1 Sites, "No Action" Sites, or New and Unevaluated Sites (i.e., those sites that were not listed in the FFA/CO). ANL-W release sites, including the OUs and the sites within each OU are illustrated in Figure 1-1. Brief descriptions of each site are provided in Section 2.2 of the *Work Plan for Operable Unit 9-04 Comprehensive RI/FS* (Lee et al., 1996). The status of WAG 9 sites is summarized in Table 1-1. More detailed information describing the screening of the co-located facilities is provided in Appendices E, F, and J of the *Work Plan for Operable Unit 9-04 Comprehensive RI/FS* (Lee et al., 1996).

OU 9-04 is listed as the "WAG 9 Comprehensive RI/FS" in the FFA/CO. This RI is tasked to consolidate the investigations previously conducted for WAG 9, and to thoroughly investigate the sites not previously assessed, for evaluation of the overall risk posed by the WAG. One release site in OU 9-04, ANL-01A, the Main Cooling Tower Blowdown Ditch (MCTBD), has been identified in the FFA/CO agreement as a Resource Conservation and Recovery Act (RCRA) land disposal unit (LDU) in addition to its listing under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This site will be evaluated as part of OU 9-04 under the FFA/CO and based on the risks associated with this site, the final disposition will be discussed in the feasibility study (FS).

The objectives of the OU 9-04 RI/FS are to:

- Identify potential data gaps that remain, following the performance of the previous assessments. Plan and implement field investigations to fill the data gaps, including investigations at the new and unevaluated sites.
- Determine the nature and extent of contamination associated with sites identified in WAG 9.



LEGEND:

OPERABLE UNIT 9-01

- (04) SEWAGE LAGOONS
- (19) IMHOFF TANK AND SLUDGE PIT
- (28) EBR-II SUMP
- (29) INDUSTRIAL LIFT STATION
- (30) SANITARY LIFT STATION
- (36) TREAT PHOTO PROCESSING DISCHARGE
- (60) KNAWA BUTTE DEBRIS PILE
- (61) EBR-II TRANSFORMER YARD
- (62) SODIUM BOILER BUILDING HOTWELL
- (63) SEPTIC TANK

OPERABLE UNIT 9-02

- (86) EBR-II LEACH PIT

OPERABLE UNIT 9-03

- (85) OPEN BURN PITS (#1, #2, AND #3)
- (31) INDUSTRIAL/SANITARY WASTE LIFT STATION
- (34) FUEL OIL SPILL BY BUILDING 755

OPERABLE UNIT 9-04

- (01) INDUSTRIAL WASTE POND AND THREE DITCHES (A, B, AND C)
  - DITCH A
  - DITCH B
- (01A) MAIN COOLING TOWER BLOWDOWN DITCH (LDU)
- (09) INTERCEPTOR CANAL MOUND
- (35) INDUSTRIAL WASTE LIFT STATION DISCHARGE DITCH
- (53) RISER PITS
  - NORTH DISCHAPGE
  - SOUTH DISCHARGE

Figure 1-1 LOCATION AND SITE CODES OF WAG 9 RELEASE SITES

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Table 1-1. Status of WAG 9 sites.

Operable Unit	Site	FFA/CO Action	Site Name	Status
None	ANL-10	None	Dry Well between T-1 and ZPPR Mound	No further action (NFA), this site was re-evaluated in the screening data gap analysis (SDGA) section of the OU 9-04 RI/FS Work Plan
None	ANL-11	None	Waste Retention Tank 783 (Never Used)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-12	None	Suspect Waste Retention Tank by 793 (Removed 1979)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-14	None	Septic Tank and Drain Fields (2) by 753 (Tank Removed 1979)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-15	None	Dry Well by 768	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-16	None	Dry Well by 759 (2)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-17	None	Dry Well by 720	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-18	None	Septic Tank and Drain Field by 789 (Removed 1979)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-20	None	Septic Tank and Drain Field by 793	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-21	None	TREAT Suspect Waste Tank and Leaching Field (Non-radioactive)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-22	None	TREAT Septic Tank and Leaching Field	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-23	None	TREAT Seepage Pit and Septic Tank West of 720 (Filled 1980)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-24	None	Lab and Office Acid Neutralization Tank	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-25	None	Interior Building Coffin Neutralization Tank	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-26	None	Critical Systems Maintenance Degreasing Unit	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-27	None	Plant Services Degreasing Unit	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-32	None	TREAT Control Building 721 Septic Tank and Leach Field (Present)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
None	ANL-33	None	TREAT Control Building 721 Septic Tank and Seepage Pit (Removed 1978)	NFA, this site was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-04	Track 1	ANL Sewage Lagoons	NFA, water loss was evaluated in the OU 9-04 RI/FS Work Plan
9-01	ANL-19	Track 1	Sludge Pit West of T-7 (Imhoff Tank) (Filled in 1979)	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-28	Track 1	EBR-II Sump (Regeneration)	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-29	Track 1	Industrial Waste Lift Station	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-30	Track 1	Sanitary Waste Lift Station	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-36	Track 1	TREAT Photo Processing Discharge Ditch	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan

Table 1-1. (continued).

Operable Unit	Site	FFA/CO Action	Site Name	Status
9-01	ANL-60	Track 1	Knawa Butte Debris Pile	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-61	Track 1	EBR-II Transformer Yard	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan. Identified the area east of the transformer yard by the underground diesel tank that will be remediated in 1997.
9-01	ANL-61A	Track 1	PCB Contaminated Soil Adjacent to ANL-61	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
9-01	ANL-62	Track 1	Sodium Boiler Building (766) Hotwell	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-01	ANL-63	Track 1	Septic Tank 789-A	NFA, the signed Track 1 document was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-02	ANL-08	Track 2	EBR-II Leach Pit (Radioactive)	NFA for the physical dimensions of the Leach Pit and identified two activities that will be completed in the OU 9-04 RI/FS with BRA. 1) Model risk to groundwater from liquid waste in vadose zone and determine when contaminants would likely be detectable at nearest well and what will the concentrations be. 2) Generate current groundwater gradient map to evaluate if down-gradient well (M-11) ANL-MON-A-011 is truly down-gradient.
9-03	ANL-05	Track 2	ANL Open Burn Pits #1, #2, and #3	NFA, the signed Track 2 Summary Report was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-03	ANL-31	Track 2	Industrial/Sanitary Waste Lift Station (Industrial Side Not Used)	NFA, the signed Track 2 Summary Report was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan. Since the signing of the NFA approximately 90 ft of underground piping from the Meter House to the Leach Pit has been removed under a best management practice housekeeping activity.
9-03	ANL-34	Track 2	Fuel Oil Spill by Building 755	NFA, the signed Track 2 Summary Report was re-evaluated in the SDGA section of the OU 9-04 RI/FS Work Plan
9-04	ANL-01	RI/FS	Industrial Waste Pond and Cooling Tower Blowdown Ditches (3)	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
9-04	ANL-01A	RI/FS	Main Cooling Tower Blowdown Ditch	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
9-04	ANL-09	RI/FS	ANL Interceptor Canal	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
9-04	ANL-35	RI/FS	Industrial Waste Lift Station Discharge Ditch	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
9-04	ANL-53	RI/FS	Cooling Tower Riser Pits	Draft RI/BRA for OU 9-04 was submitted to EPA and IDHW on March 31, 1997
10-06	-	RI/FS	ANL-W Windblown Area	This OU 10-06 site will be included into the OU 10-04 record of decision (ROD)
10-06	-	RI/FS	ANL-W Stockpile	Remediated in 1995, and will be included into the OU 10-04 ROD.

- Determine if site-specific transport properties have been sampled and analyzed during past sampling activities at ANL-W. These site specific parameters will be used where applicable in modeling of contaminants to the ground water.

- Determine the current and future cumulative and comprehensive risk posed by the contaminants of concern (COCs) to human health and the environment.

- Conduct literature searches and interviews and review results of past investigations to develop and evaluate the candidate remediation technologies.

- Develop and evaluate the appropriate remedial alternatives based on the nine CERCLA criteria.

The first four objectives are addressed in the RI/Baseline Risk Assessment (BRA) sections of the RI/FS. The last two objectives will be addressed in the FS sections of the RI/FS.

The first step in the performance of the RI/FS was the preparation of OU 9-04 RI/FS Work Plan. The Work Plan provided the management framework and identified the requirements for conducting the RI/FS. It included the outline for the investigation of the previously uncharacterized sites and the sites with data gaps.

The Screening Level Ecological Risk Assessment (SLERA) identified the WAG 9 contaminants that could cause undesirable ecological effects and provided rationale for future ecological risk assessments (ERAs). The Sample Data Gap Analysis (SDGA) outlined the screening methodology and results for WAG 9 sites and contaminants. The objectives of the studies included identifying the remaining data gaps after previous actions (i.e., Track 1, Track 2, or interim actions) had been performed. The WAG 9 sites were screened to determine which sites and which contaminants of potential concern (COPCs) would be retained for evaluation in the BRA. For the retained sites, a pathway analysis was conducted, and the preliminary Conceptual Site Model (CSM) was refined.

Data gaps existed at the sites when a risk evaluation was not completed or because no analytical data were available, or analytical data were available but the risk assessment had not been performed. These data gaps were addressed in the SDGA. For one site [i.e., ANL-61A polychlorinated biphenyl (PCB) spill], the extent of suspected contamination was confined by the building foundation and basalt bedrock. It was determined that the most cost effective solution would be to remediate the area and take validation samples rather than funding an additional field investigation to determine the extent of contamination. Investigations were required to further characterize the vertical nature and extent of the contamination below the EBR-II Leach Pit and to install an additional monitoring well downgradient of ANL-01A (MCTBD) outfall. The Work Plan addressed the planning and implementation of the field investigations necessary to fill these data gaps.

A preliminary field investigation was conducted for most OU 9-04 sites in 1994. These pre-RI samples were collected in an effort to expedite the cleanup of the WAG 9 facility and were included in the *Sampling and Analysis Plan for OU 9-03 Track 2 sites* (Lee 1994). These pre-RI samples are included in the data sets for the WAG 9 sites.

The WAG-wide BRA includes an evaluation of the following:

- Sites designated as "no action" in the FFA/CO

- "No further action" sites determined through the Track 1 and Track 2 processes
- Co-located site evaluation
- New and unevaluated sites
- The baseline risk at each of the retained sites
- The cumulative and comprehensive risk for the entire WAG
- Hydrogeologic evaluation for the entire WAG.

The comprehensive risk assessment will be an assessment of the risk posed when exposure pathways from all WAG 9 waste sites are evaluated spatially and temporally to determine whether the sum of the risks posed by multiple sites' exposure pathways collectively increases the risk posed by individual site exposure pathway(s). The term "comprehensive" is used to describe the fact that the OU 9-04 BRA will evaluate all sources of contamination at ANL-W. The cumulative risk is the evaluation provided by the cumulative analysis method for the air and groundwater pathways. It is the method through which the combined risks from multiple release sites will be calculated. The potential for risk at individual sites will be identified through nature and extent of contamination at each site as described in Section 4.

The FS will be conducted to develop and evaluate specific remedial action alternatives using the nine CERCLA criteria. The Proposed Plan will present the preferred remedial alternative and other options. The remedial alternative will be selected in the ROD after evaluation of relevant comments received from the public on the Proposed Plan.

1.2 Site Background

The INEEL (Site) is a Government-owned test site managed by the Department of Energy (DOE). The INEEL has been devoted to nuclear energy research and related activities since being established in 1949. The INEEL was originally designated as the National Reactor Testing Station (NRTS) by the U.S. Atomic Energy Commission (AEC). The NRTS provided an isolated location where nuclear reactors and support facilities could be built and tested. In 1974, the NRTS was redesignated as the Idaho National Engineering Laboratory (INEL) to reflect the broad scope of engineering activities taking place and subsequently renamed the INEEL in 1997 to reflect its new mission involving environmental activities. A large variety of laboratory activities and test facilities support the DOE and other Government-sponsored research, development programs, and projects at the INEEL.

The INEEL lands are within the aboriginal land area of the Shoshone-Bannock Tribes. The Tribes have used the land and waters within and surrounding the INEEL for fishing, hunting, plant gathering, medicinal, religious, ceremonial, and other cultural uses since time immemorial. These lands and waters provided the Tribes their home and sustained their way of life. The record of the Tribes' aboriginal presence at the INEEL is considerable, and DOE has documented an excess of 1,500 prehistoric and historic archeological sites at the INEEL.

Most INEEL facilities are currently operated by one of three Government contractors: Lockheed Martin Idaho Technologies Company (LMITCO), Westinghouse Electric Corporation, and Argonne National Laboratory-West (ANL-W). These contractors conduct various programs at the INEEL under

the supervision of three DOE offices: DOE-ID, Department of Defense (DOD)-Pittsburgh Naval Reactors Office, and DOE-CH.

ANL-W, a prime operating contractor to DOE-CH, began a redirected nuclear research and development program in FY 1995. The redirected program involves research to help solve near-term high priority missions including the treatment of DOE spent nuclear fuel and reactor decontamination and decommissioning technologies. ANL-W is also currently in the process of conducting shutdown and termination activities for the Experimental Breeder Reactor II (EBR-II). Within the ANL-W site are a number of research and support facilities that contribute to the total volume of waste generated at ANL-W. These facilities currently generate radioactive low-level waste, radioactive transuranic waste, hazardous waste, mixed waste, sanitary waste, and industrial waste.

1.2.1 Site Description

The INEEL Site occupies approximately 890 square miles (2,300 km^2) of the northwestern portion of the eastern Snake River Plain (SRP) in southeast Idaho. The INEEL site is nearly 39 miles (63 km) long from north to south and about 36 miles wide in its broadest southern portion. The INEEL includes portions of five Idaho counties (Bingham, Bonneville, Butte, Clark, and Jefferson) and lies within Townships 2 to 8 N and Ranges 28 to 34 E, Boise baseline and meridian. Figure 1-2 shows the configuration of the INEEL and identifies some of its major facilities.

The surface of the INEEL is a relatively flat, semiarid, sagebrush desert, with predominant relief being manifested either as volcanic buttes jutting up from the desert floor or as unevenly surfaced basalt flows or flow vents and fissures. Elevations on the INEEL range from 5,200 ft in the northeast to 4,750 ft in the central lowlands, with an average elevation of 4,975 ft. Figure 1-3 shows the shaded relief map of the WAG 9 and the rest of the INEEL.

1.2.2 Site History

The ANL-W was established in the mid 1950s and is located approximately 30 miles west of Idaho Falls. ANL-W houses extensive support facilities for three major reactors: Transient Reactor Test Facility (TREAT), EBR-II, and the Zero Power Physics Reactor (ZPPR).

The first reactor to operate at the ANL-W site was TREAT, which was built in 1959. As its name implies, TREAT was designed for overpower transient tests of fuel. Its driver fuel, consisting of finely divided uranium oxide in a graphite matrix, has a high heat capacity that enables it to withstand tests in which experimental fuel may be melted. Used extensively at first for safety tests of water-reactor fuels, TREAT is now used mainly for safety tests for various fuel types as well as for non reactor experiments. It has periodically undergone modifications as part of the TREAT upgrade project.

The EBR-II a 62.5 megawatt thermal reactor went into operation in 1964 capable of producing 19.5-megawatts of electrical power in the liquid metal reactor power plant. It is a pool-type sodium-cooled reactor, designed to operate with metallic fuel. It was provided with its own Fuel Cycle Facility (FCF) adjacent to the reactor building for remote pyrometallurgical reprocessing and refabrification of reactor fuel. The Fuel Cycle Facility operated from 1964 providing five complete core loadings of recycled fuel for EBR-II.

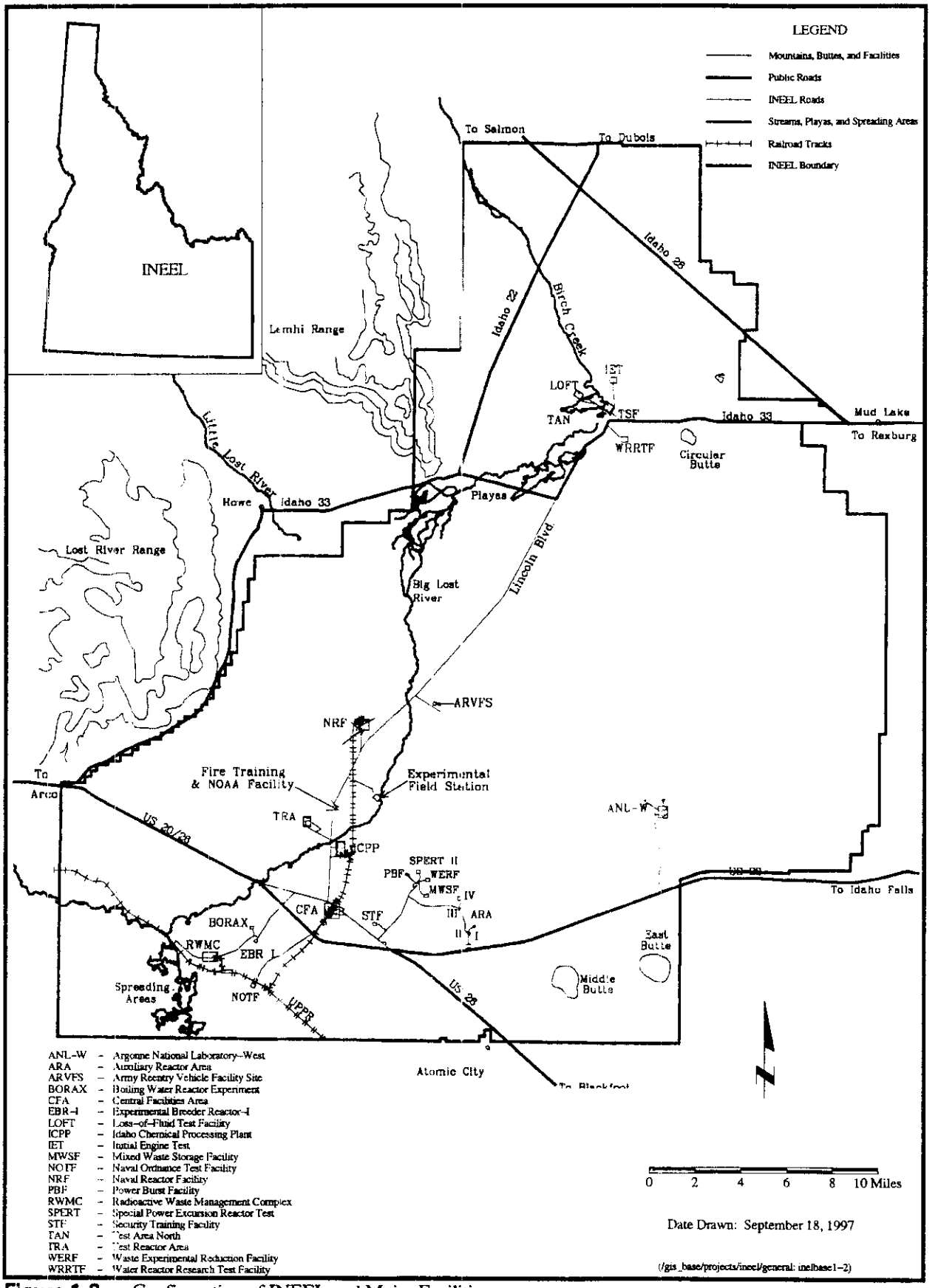

Figure 1-2. Configuration of INEEL and Major Facilities.

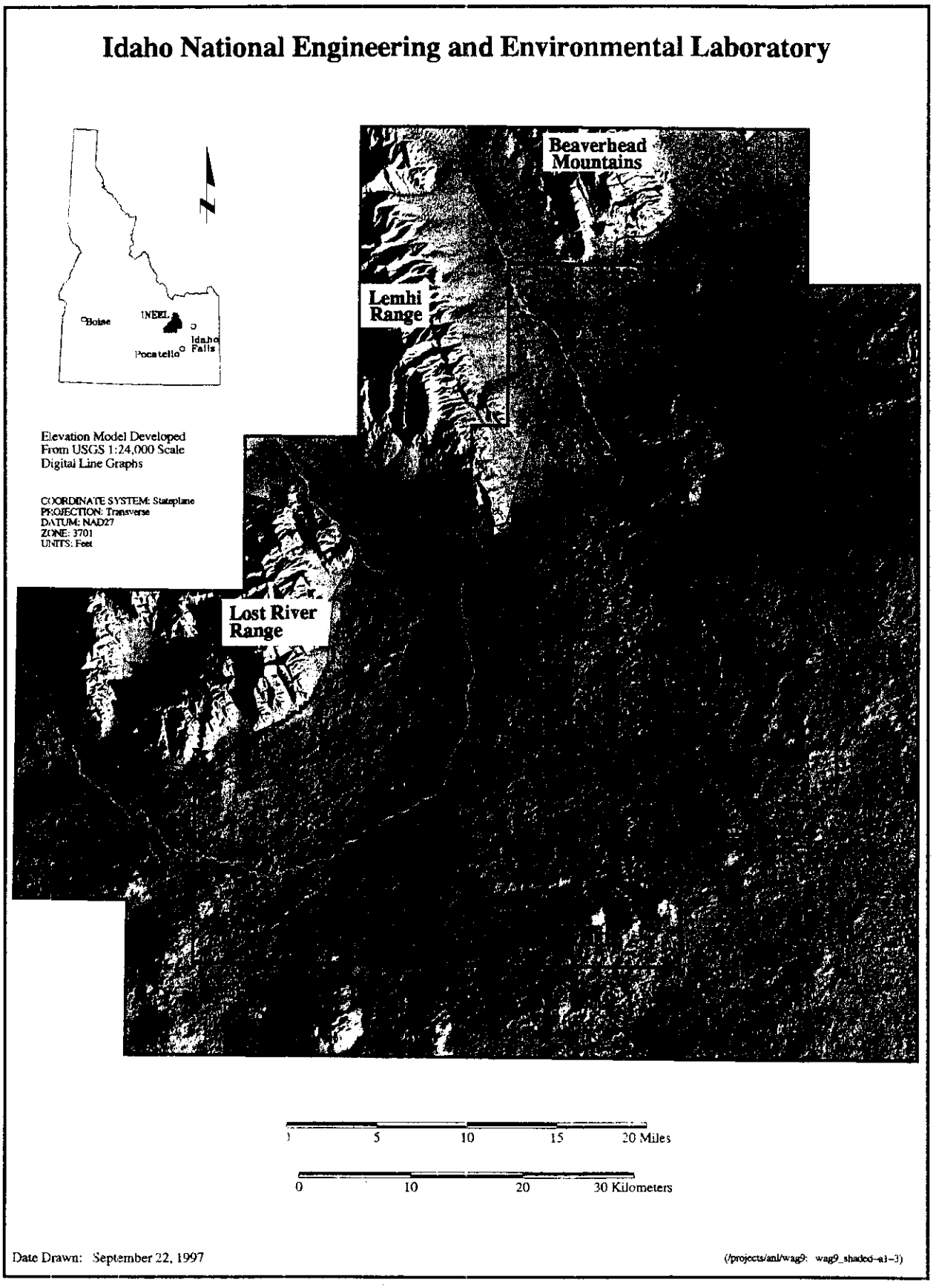

Figure 1-3. Shaded relief map of WAG–9 and INEEL.

Over the years, the mission of the EBR-II has been redirected from that of a power-plant demonstration with integral fuel cycle to that of an irradiation test facility for mixed uranium-plutonium oxide fuels for future liquid metal reactors. The pyrometallurgical process used in the Fuel Cycle Facility was not suitable for ceramic fuels so the Fuel Cycle Facility was converted to a Hot Fuel Examination Facility South (HFEF/S).

EBR-II continued to be fueled with metallic uranium driver fuel for operating convenience. This fuel was gradually improved to greatly increase its burnup, thus contributing to a high plant factor for irradiation tests. Over the years of operation, much valuable operating experience has been gained on sodium systems, including the removal and maintenance of primary sodium pumps and other components. In the 1970s, the mission of the EBR-II was again shifted in emphasis, this time to the Operational Reliability Testing Program. This program was aimed at studying the milder but more probable types of fuel and reactor malfunctions that could lead to accident sequence. In addition to preventing accidents, its aim was to better define the operating limits and tolerable faults in reactor operation, thus leading to both safer and more economical plants. The components of this program in EBR-II included tests of fuel to and beyond cladding breach, loss-of-flow tests, mild power transients, and studies of man-machine interfaces.

In the early 1980s, ANL-W reexamined the basic design of liquid-metal-cooled fast reactors. The results of this study led to the Integral Fast Reactor (IFR) concept. The IFR incorporates four basic elements: sodium cooling; a pool configuration; a compact, integral fuel cycle facility; and a ternary metal alloy fuel. Modifications to the EBR-II and the HFEF/S facilities have been made to support the pyroprocessing and fuel manufacturing for the IFR demonstration project. ANL-W is currently in the process of conducting shutdown and termination activities for the EBR-II. These shutdown activities include defueling and draining the primary and secondary sodium loops and placing the reactor in a radiologically safe condition.

The ZPPR was put into operation at ANL-W in 1969. The ZPPR is large enough to enable core-physics studies of full-scale breeder reactors that will produce up to 1,000 megawatts. ZPPR has also been used for mockups of metallic cores and space-reactor cores. ZPPR was placed in programmatic standby in fiscal year 1989.

Various chemical and radioactive wastes were generated from these three reactors and the support facilities at ANL-W. The operation of these facilities and the corresponding waste streams have been evaluated and documented in the Facility Assessment and Screening document 1973. This document, which is based on process knowledge, has been used as an initial starting point for ANL-W cleanup activities.

Potential release sites identified at ANL-W facilities in the FFA/CO (DOE 1991) include wastewater structures and leaching ponds, underground storage tanks, rubble piles, cooling towers, an injection well, french drains, and assorted spills. Possible COPCs include petroleum products, acids, bases, PCBs, radionuclides, and heavy metals. These are the chemical and radioactive wastes generated from the scientific and engineering research at ANL-W. Section 4 of this document provides further descriptions of the contaminant nature and extent of contamination associated with WAG 9.

1.2.3 Previous Investigations

In the FFA/CO, the WAG 9 sites are listed as follows: 18 No Action sites, 10 OU 9-01 Track 1 sites, one OU 9-02 Track 2 site, three OU 9-03 Track 2 sites, and five OU 9-04 RI/FS sites. To date, all 10 Track 1 sites have been signed No Further Action determination in Decision Documentation Packages with ANL-04 requiring further evaluation of the water loss in the RI/FS (Section 3.1.1.1.1), and ANL-61A

requiring additional Polychlorinated Biphenyl (PCB) removal (Section 3.1.1.1.8). Both Track 2 OUs (9-02 and 9-03) have been signed No Further Action by the Remediation Project Managers (RPMs) in Summary Reports with additional modeling in the RI/FS for contaminants in the vadose zone for ANL-08 (Sections 3.1.1.2 and 5.7.3). And in 1994, pre RI samples were collected of the OU 9-04 sites, and the results were submitted to EPA and IDHW for review and comment in the form of Preliminary Scoping Packages.

In February 3–4, 1994, a WAG 9 scoping meeting was held at the ANL-W facility to discuss the scoping documents (OU 9-04 Preliminary Scoping Packages) that were submitted for review and to discuss the possibilities of accelerating the Comprehensive RI/FS. Those who attended this meeting were WAG 9 managers from EPA, IDHW, DOE-CH, and ANL-W Environmental Remediation personnel. At this meeting, all of the 19 identified FFA/CO sites were discussed, and WAG 9 managers' concerns/resolutions as well as recommendations for future sampling, and methods for accelerating the FFA/CO process were discussed. ANL-W personnel have since conducted the pre-RI sample collection activities in OU 9-04 to fill the identified data gaps in order to complete the Comprehensive RI/FS in an accelerated manner.

1.2.4 Regulatory Background

The EPA proposed listing the INEEL on the National Priorities List (NPL) of the National Contingency Plan (NCP) July 14, 1989 [54 Federal Register (FR), 1989, 29820]. This was accomplished using the hazard ranking system procedures found in the NCP. After considering the 60-day public comment period following the proposed INEEL listing, EPA issued a final rule listing the INEEL as an NPL site in the FR, November 21, 1989 (54 FR, 1989, 44181).

The FFA/CO was developed to establish the procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions at the INEEL in accordance with CERCLA, RCRA, and the Idaho Hazardous Waste Management Act. The FFA/CO action plan identified four OUs (within ANL-W WAG 9) to be addressed through the CERCLA process. OU 9-04 is the Comprehensive Investigation of the entire WAG 9 site and will review the decisions of OU 9-01, OU 9-02, and OU 9-03, and include other sites that have been identified but have not yet been investigated under other OUs.

One unit in OU 9-04 [site code ANL-01A (MCTBD)] was originally included as a Land Disposal Unit under the RCRA Consent Order and Compliance Agreement (COCA) on the basis that corrosive liquid wastes were discharged after 1980. ANL-W, along with the DOE-CH, EPA, and IDHW WAG 9 managers, have determined that as stated in the FFA/CO, if the MCTBD does not pose a risk greater than those specified in the NCP, the RCRA closure requirements will not be applicable. The results of the risks from this unit will be further discussed in the FS.

1.3 Report Organization

The organization of this report generally follows the suggested format provided in the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). This report is a summary report and is designed to supplement previous reports by providing new information gained during the field investigation and by providing the results of the comprehensive BRA. Where applicable, only summary information is provided for sites that are evaluated in detail in previous reports.

Section 1 provides a history of ANL-W and brief descriptions of the facility, of previous investigations, and of the regulatory history leading up to the completion of this Comprehensive RI/FS.

Section 2 provides information on the physical setting of the ANL-W.

Section 3 discusses the history of investigations and the COCs for each of the sites included in the RI/BRA.

Section 4 presents the evaluation of the nature and extent of contamination at each site.

Section 5 presents the BRA, both for individual sites and a comprehensive risk assessment for the entire WAG.

Section 6 presents the ecological risk evaluation for WAG 9.

Section 7 the feasibility study starts with the development of remedial action objectives and general response actions.

Section 8 develops the remedial action alternatives for WAG 9 in this section..

Section 9 presents the screening of the alternatives presented in Section 8.

Section 10 presents the detailed analysis of the alternatives.

Section 11 presents the summary of the remedial investigation/feasibility study. The review of the sites that were retained, contaminants of concern, exposure pathways, for human health and ecological receptors.

Appendices A through L include a summary of the OU 9-04 field sampling data, groundwater modeling methodologies and GWSCREEN output runs, documentation to support the human health and ERAs, a justification for combining results of the OU 9-04 contaminated soils model, ANL-W background concentrations, and cost estimates for retained alternatives.

1.4 References

DOE, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, State of Idaho Department of Health and Welfare, U.S. Environmental Protection Agency, U.S. Department of Energy, December 4.

EPA, 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*.

Lee, 1994, *Sampling and Analysis Plan for OU 9-03 Track 2 Sites*, October 13, 1994.

Lee et al., 1996, Work Plan for Operable Unit 9-04 Comprehensive RI/FS, July 29, 1996.